JAN 13 1992 (13) SWI 4

START

0019740

ENGINEERING DATA TRANSMITTAL

1. EDT 133505

2. To: (Receiving Organization) B Plant Engineering	3. From: (Originating Organization) B Plant Environmental Engineering	4. Related EDT No: N/A
5. Proj/Prog/Dept/Div: Environ. Engineering	6. Cog/Proj Engr: W. E. Davis	7. Purchase Order No: N/A
8. Originator Remarks: Release		9. Equip/Component No: N/A
		10. System/Bldg/Facility: B Plant
		12. Major Assm Dwg No: N/A
11. Receiver Remarks:		13. Permit/Permit Application No. N/A
		14. Required Response Date: N/A

15. DATA TRANSMITTED

(A) Item No.	(B) Document/Drawing No.	(C) Sheet No.	(D) Rev No.	(E) Title or Description of Data Transmitted	(F) Impact Level	(G) Reason for Transmittal	(H) Originator Disposition	(I) Receiver Disposition
1	WHC-SD-WM-PLN-029		0	B Plant Chemical Sewer Sampling and Analysis Plan	3	1	1	1

MAR 1992 RECEIVED EDMC

16. KEY

Impact Level (F)	Reason for Transmittal (G)	Disposition (H) & (I)
1, 2, 3, or 4 see MRP 5.43 and EP-1.7	1. Approval 2. Release 3. Information 4. Review 5. Post-Review 6. Dist (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged

17. SIGNATURE/DISTRIBUTION (See Impact Level for required signatures)

(G) Reason	(H) Disp	(J) Name	(K) Signature	(L) Date	(M) MSIN	(J) Name	(K) Signature	(L) Date	(M) MSIN	(G) Reason	(H) Disp
1	1	Cog./Proj. Eng W. E. Davis	W.E. Davis	1/9/92	56-70						
1	1	Cog./Proj. Eng. Mgr. M. W. Stevenson		1-8-9?	56-70						
1	1	QA D. D. McAfee	D McAfee	12/12/91	S4-69						
		Safety									
1	1	Environmental R. K. P'Pool	RKPP	12-17-91	T1-30						

18.	19.	20.	21. DOE APPROVAL (if required)
W.E. Davis 1/8/92 Signature of EDT Originator Date	W.E. Davis 1/9/92 Authorized Representative for Receiving Organization Date	M.W. Stevenson 1-8-92 Cognizant/Project Engineer's Manager Date	Ltr No. ☐ Approved ☐ Approved w/comments ☐ Disapproved w/comments

CHECKLIST FOR INFORMATION RELEASE REQUEST SIGNATORIES

This checklist provides the responsibilities of each reviewer. It is meant to be used as a checklist and requires no signatures. The list is not all-inclusive but covers the key areas needing review. Areas needing further review or other areas needing review should be indicated under comments.

AUTHOR/REQUESTOR

[x] The project or program manager concurs with the issuance of this report.
[x] The reference citations are necessary, correct and appropriate for the intended audience and will be publicly available at the time the document is published.
[NA] If a journal article, the reference style agrees with guidance from the client or journal publisher.
[NA] Contributions from authors of other organizations indicated in the comment section of this form.
[x] The document is responsive to the client's scope of work.
[x] The client approved this for release.
[x] The document reports or reflects quality technical work.
[x] The scientific methodology used is logical and reasonable.
[x] The inferences and conclusions are soundly based.

RESPONSIBLE MANAGER

Indicated at the bottom of the comment section of this form that General Counsel's office should review this document with particular attention to:

[NA] an invention (reported or unreported)
[NA] new software developed at WHC
[NA] sensitive subject matter (policies, issues, concerns)
[NA] copyrighted information
[NA] trademark information
[NA] proprietary information.

If the funding for the program represented by the document is from the Assistant Secretary for Nuclear Energy (NE), and public clearance or limited clearance for foreign exchange (sponsor-limited) is requested, the following information is required:

[NA] Information generation dates
[NA] Prior dissemination to DOE contractors
[NA] Prior dissemination under international agreements
[NA] Substantive value for international exchange
[NA] Justification for release of information.

AUTHORIZED DERIVATIVE CLASSIFIER

Document reviewed for [and indicated on the front of the form] the presence of the following:

[] Classified information
[] Unclassified Controlled Nuclear Information (UCNI)
[X] Unclassified Information.

GENERAL COUNSEL REVIEWER

Document reviewed for [and indicated on the front of the form] the presence of the following:

[] previously reported or as yet unreported patentable subject matter
[] copyrighted material
[] trademarks
[] proprietary information
[] product comparisons
[] inventions
[] new software developments
[] Technical information meets environmental compliance.

COMMUNICATIONS DEPARTMENT REVIEWER

[] This document contains no unresolved company policy issue.
[] WHC logotype is used correctly.

WHC AND DOE TECHNICAL PROGRAM REVIEWER

Document reviewed for [and indicated on the front of the form] the presence of the following:

[] Applied Technology Information
[] Limited Disclosure Information (foreign exchange)
[] Distribution list discussed with the client
[] Others who should review this document before release indicated in the comment section of this form.

PUBLICATIONS SERVICES REVIEWER

[] The structure of the document is appropriate for the subject matter.
[] The overall format is appropriate for the client.
[] Basic editorial concerns are addressed.
[] Nomenclature and symbols used are consistent with accepted standards.

INFORMATION RELEASE ADMINISTRATION

[] All reviews are complete and this publication or presentation is approved for release (after resolution of mandatory comments).

ID Number

Lead Author	Phone	MSIN	Other Author(s) or Requestor
W. E. Davis	2-0014	S6-70	
Project or Program	**Lead Org Code**		**Sponsor Agency (DOE, DOT, NRC, USGS, etc.)**
Defense Waste Remediation	85151		DOE
Editor	**Phone**	**MSIN**	**DOE/HQ Program (DP, EH, EM, NE, etc.)**
NA			EM

Mandatory Comments*	Reviewer Name & Signature	Date	Resolution	Date

*Only mandatory comments are to be documented. All other comments should be made on a copy of the information submitted for review and returned to the author.

Legends/Notices/Markings

	Affix Yes	Affix No	Remove Yes	Remove No
Applied Technology	[ ]	[ ]	[ ]	[ ]
Business-Sensitive Information	[ ]	[ ]	[ ]	[ ]
Computer Software Notice	[ ]	[ ]	[ ]	[ ]
Copyright License Notice	[ ]	[ ]	[ ]	[ ]
Export Controlled Information	[ ]	[ ]	[ ]	[ ]
Legal Disclaimer	[ ]	[X]	[ ]	[ ]
Limited Disclosure	[ ]	[ ]	[ ]	[ ]
Patent Status	[ ]	[ ]	[ ]	[ ]
Predecisional Information	[ ]	[ ]	[ ]	[ ]

	Affix Yes	Affix No	Remove Yes	Remove No
Programmatic Notice	[ ]	[ ]	[ ]	[ ]
Proprietary Information	[ ]	[ ]	[ ]	[ ]
Purpose and Use	[ ]	[ ]	[X]	[ ]
Thesis/Dissertation	[ ]	[ ]	[ ]	[ ]
Trademark Disclaimer	[ ]	[ ]	[ ]	[ ]
Unclassified Controlled Nuclear Information/Official Use Only	[ ]	[ ]	[ ]	[ ]

N/A

Responsible Manager (Printed/Signature)

SUPPORTING DOCUMENT	1. Total Pages ~~19~~ 38 weg 1/9/92

2. Title	3. Number	4. Rev No.
B-Plant Chemical Sewer Sampling and Analysis Plan	WHC-SD-WM-PLN-029	0

5. Key Words	6. Author
Chemical Sewer, Sampling, Chemical and Radiological Analysis, Not a Dangerous Waste	Name: William E. Davis William E Davis Signature Organization/Charge Code 85151/D319B

7. Abstract

A sampling and analysis plan for the B-Plant Chemical Sewer is described. The purpose of the plan is to characterize chemical and radiological content of the liquid effluent and to confirm the streams designation as not a dangerous waste.

APPROVED FOR PUBLIC RELEASE 1/13/92 KMB

9. Impact Level 3

10. Authorized Manager's Name
Marc W. Stevenson
MW Stevenson
Authorized Manager's Signature

Specify Distribution Limit External

11. RELEASE STAMP

OFFICIAL RELEASE BY WHC (13)
DATE JAN 13 1992
STA 4

9 2 1 2 2

A-6400-073 (7/90) (EF) WEF124
Supporting Document (Cover Sheet)

B PLANT
CHEMICAL SEWER
SAMPLING AND ANALYSIS PLAN

January, 1991

PREPARED BY

W. E. Davis

B Plant Environmental Engineering

WESTINGHOUSE HANFORD COMPANY
HANFORD OPERATIONS AND ENGINEERING CONTRACTOR
FOR THE
U.S. DEPARTMENT OF ENERGY

TABLE OF CONTENTS

B-PLANT CHEMICAL SEWER SAMPLING AND ANALYSIS PLAN

A. INTRODUCTION

The Sampling and Analysis Plan (SAP) for the B-Plant Chemical Sewer (BCE) is designed to document the chemical and radiological content of the BCE effluent. The procedure used to provide documentation is described in this document. The BCE SAP will be revised as necessary to ensure that it will document the chemical and radiological composition of the BCE effluent.

B. SAMPLING OBJECTIVES

This sampling plan provides information on how the B-Plant Chemical Sewer (BCE) liquid effluent will be sampled and analyzed to accomplish the following:

1. Provide characterization data for the BCE liquid effluent stream during different facility operational configurations.

2. Confirm the waste designation as identified in the B-Plant Chemical Sewer Stream-Specific Report (WHC-EP-0342, Addendum 6) per WAC 173-303-070.

In addition, the data collected by this sampling plan will be available for use: to provide confirmatory data for the WAC 173-240 Engineering Report to support the Best Available Technology-Economically Achievable evaluations and liquid effluent treatment system design, and to provide data on chemical and radiological constituents in order to determine loading and rate of migration to support the assessment of impacts on continued discharge.

Quality Assurance objectives associated with the sampling protocol for this sampling plan are described in the Liquid Effluent Sampling Quality Assurance Project Plan (WHC-SD-WM-QAPP-011).

C. SITE BACKGROUND

This section describes the B-Plant Facility that produces the BCE liquid effluent, the BCE liquid effluent stream and its sources, and the disposal site receiving the BCE liquid effluent.

C.1 B-PLANT FACILITY DESCRIPTION

The B-Plant Facility is located in the 200 East area at Hanford. This facility contains two major operating system areas, the Waste Encapsulation and Storage Facility (WESF) and the 221-B Building. Both operating system areas are required to carry out B-Plant Facilities's mission which is to ensure safe storage and management of radiological inventories. In WESF the inventory consist of Strontium and Cesium capsules while 221-B Building has a substantial radiological inventory remaining from previous production campaigns. Although no production activities are currently taking place at this facility, several operating systems are required to accomplish the B-Plant Facility mission.

B-PLANT CHEMICAL SEWER SAMPLING AND ANALYSIS PLAN

The major operating systems contributing to the BCE liquid effluent stream from the B-Plant Facility are the systems for generation of demineralized water, for generating compressed air, and for conditioning of water used in heating, ventilation, and air conditioning (HVAC) units.

Other support buildings at B-Plant include the 271-B Building, 217-B Building and 211-BA Building. The 271-B Building contains operations offices and the Aqueous Makeup Unit (AMU), chemical makeup tanks, while the 217-B Building is used to produce demineralized water used in the facility. The 211-BA Building is a liquid effluent neutralization facility for the BCE liquid effluent.

C.2 STREAM DESCRIPTION

The BCE liquid effluent stream is designated as not a dangerous waste (WHC 1990). It consists of heating, ventilation, and air conditioning condensate, steam condensate, cooling water for air compressors, condensate from air compressors, potentially radiologically contaminated water from floor drains, overflow discharge from 2902-B Emergency Sanitary Water supply, effluent from the demineralizer during a periodic regeneration of the cation and anion columns, and storm water runoff from three street drains (Figure 1) (see Appendix A for a description of individual contributors).

Past sampling, analysis, and process knowledge have indicated that the BCE liquid effluent is not a dangerous waste (WHC 1990). This stream was designated as not a dangerous waste by comparing sample data to the dangerous waste criteria (WAC 173-303-100) and dangerous waste characteristics (WAC 173-303-090). Detailed documentation is provided in the B-Plant Chemical Sewer Stream Specific Report (WHC-EP-0342, Addendum 6).

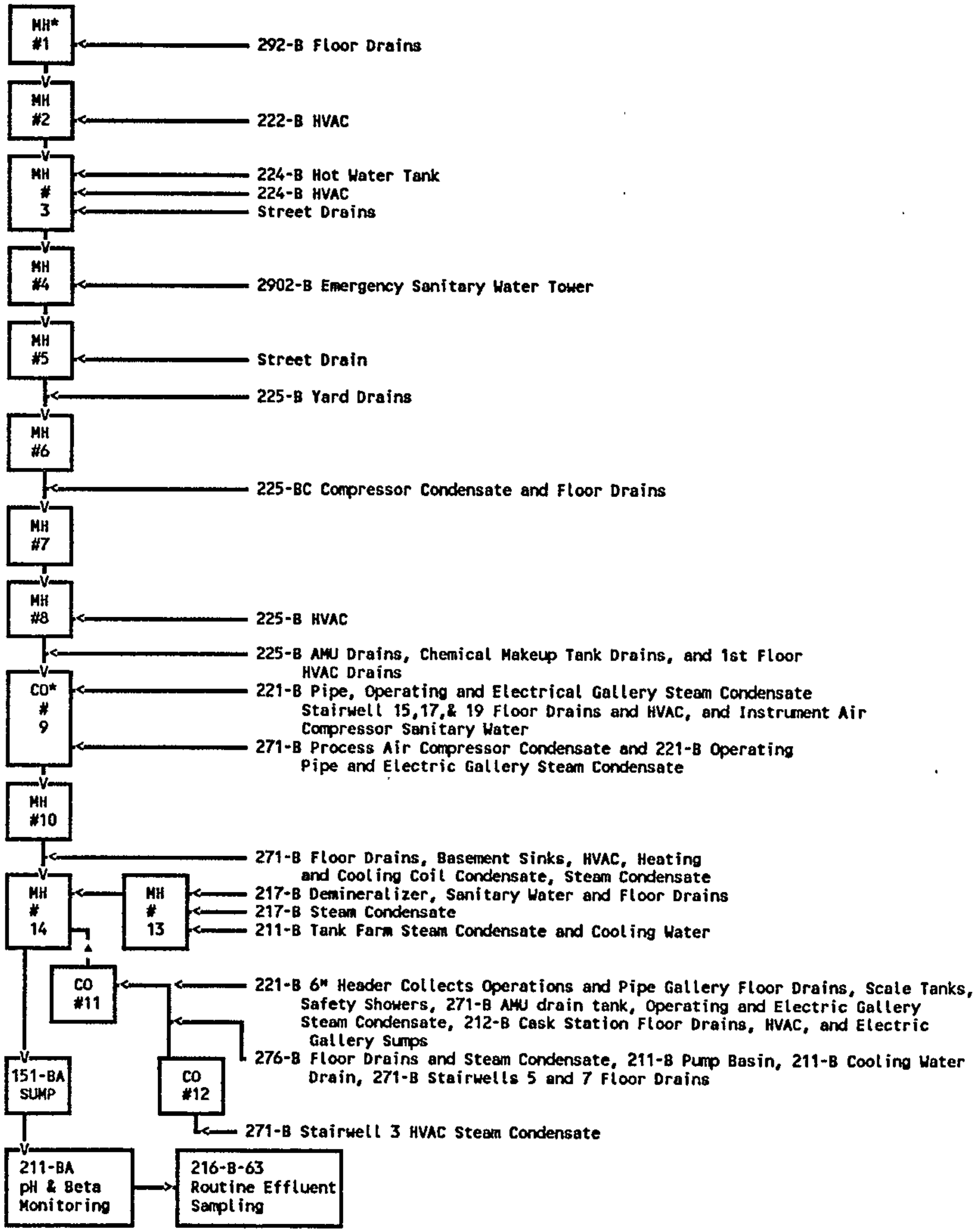
Portions of the BCE liquid effluent stream have the potential for contamination from radiological and non-radiological contamination. To avoid the release of radiological contaminated water to the BCE liquid effluent stream, water from potentially radiologically contaminated areas in 221-B are diverted to tank TK-10-1 and sent to the 200-E Tank Farms.

A small fraction of the stream comes from HVAC units. Both 225-B and 221-B HVAC units are operated continuously. Since the HVAC treats the inflow air, potentially contaminated air, being drawn downstream, has a low probability of reaching and contaminating the HVAC condensate.

The volume of the BCE effluent stream is approximately 185,000 gal/d (WHC 1991c). Two major contributors to this volume are cooling water for the air compressors in 225-BC and 271-B (Table 1). These two contribute approximately 80% of the volume of the liquid effluent. Another major contributor to the volume of the stream, approximately 10%, is the overflow from the Emergency Sanitary Water Tower. This overflow maintains fresh sanitary water.

B-PLANT CHEMICAL SEWER SAMPLING AND ANALYSIS PLAN

Figure 1. BCE Stream Flow Schematic



* Manhole-MH and Cleanout-CO

Table 1 Major Volume Contributors to The BCE

Contributors	Per Cent of Total Volume (Estimated)
225-BC Air Compressors Cooling Water	40
271-B Air Compressors Cooling Water	40
2902-B Emergency Sanitary Water Overflow	10
Others (See Appendix A)	10
TOTAL =	100

C.3 216-B-63 DITCH

The 216-B-63 Ditch, constructed in May 1970, currently receives the liquid effluent from the BCE. It is a percolation trench approximately 1500 feet long and approximately 8 feet wide in cross section at the bottom.

D. RESPONSIBILITIES

B-Plant Engineering personnel have prepared this Sampling and Analysis Plan. In addition, Environmental Assurance personnel will provide additional technical support to the sampling activities as necessary. The BCE Cognizant Engineer from B-Plant Environmental Engineering will be the Sampling Task Leader and will be responsible for scheduling operators and health physics technicians to support the sampling team, reviewing data logs, sampling, surveying chain of custody of samples and data.

Protocol sampling (non-routine sampling) will be performed by Westinghouse Hanford Company (WHC) Sampling and Mobile Laboratory (SML) personnel. These sampling personnel are qualified CERCLA and RCRA samplers, and will not require observation by a QA representative. These personnel will also ensure that the protocol samples meet the quality assurance criteria of EPA's SW-846. (These personnel are responsible for preservation, collection, security, and shipment of the samples).

SML personnel will deliver radiological screening samples, taken at each sampling event to classify total activity for shipping purposes, to the 222-S Laboratory after B-Plant health physics technicians have surveyed and released the sample containers. If the samples meet Department of Transport, DOT, guidelines for non-hazardous and non-radioactive materials, SML personnel will prepare the shipping papers and carry the samples to WHC Shipping for offsite shipment. If the samples do not meet the DOT guidelines, Field Shipping

B-PLANT CHEMICAL SEWER SAMPLING AND ANALYSIS PLAN

Support personnel will check that the protocol samples have been correctly packaged and will prepare the samples for shipment to the offsite analytical laboratory. The handling and shipping of the protocol samples will meet the requirements of Westinghouse Hanford Company's Environmental Investigation Instruction 5.11.

Office of Sample Management (OSM) will schedule laboratories for sample analysis, tracking of samples, and data validation.

E. SAMPLING LOCATION AND FREQUENCY

This section describes sampling location and frequency of protocol sampling for the BCE effluent stream.

E.1 SAMPLING LOCATION

The protocol grab sampling of the combined BCE liquid effluent will be performed at the 211-BA Building or Manhole 14, since these locations are downstream from all contributors. Three additional protocol grab samples will represent background of the input liquid streams entering B-Plant and the BCE. These protocol grab samples (shown in Table 2) will be taken at Manhole 4, 294-B, and 284-B. The grab sample at Manhole 4 is of the sanitary water overflow background contribution to the BCE liquid effluent while the grab protocol sample at 294-B is of the background raw water supply to B Plant Facility. The grab protocol sample at 284-B Powerhouse is of the background steam condensate from the steam supply to the B-Plant Facility.

TABLE 2 PROTOCOL SAMPLING LOCATIONS

SAMPLE	SAMPLE LOCATION	DESCRIPTION
1.	211-BA or Manhole 14	Combined BCE Stream
2.	Manhole 4	Sanitary water overflow into BCE
3.	294-B	Raw water supply to B Plant
4.	284-B Powerhouse	Steam condensate from steam supply to B Plant

E.2 FREQUENCY

Protocol samples at all four locations will be taken initially twice a year to characterize each different operating conditions effecting the effluent stream. The first set of protocol samples will be taken when no regeneration liquid from the demineralizer ion columns is being added to the BCE liquid effluent, while the second set will be taken during the time when the neutralized regeneration is being released to the BCE effluent stream. This regeneration of the ion exchange columns uses sodium hydroxide and sulfuric acid solutions which are buffered and stored in tank SK-161. This effluent, approximately 20,000 gallons is released into the BCE over a multi-day period. The regeneration takes place periodically, i.e. approximately 2-3 times a year. Additional protocol samples will be collected, as determined by the BCE Cognizant Engineer, to obtain data reflective of changes in process operational conditions.

Following the initial characterization of the BCE stream with protocol samples, additional protocol sampling of the inflow background streams at Manhole 4, 294-B, and 284-B will be performed as needed. The protocol sample characterizing the BCE combined stream will be taken twice annually as noted in the previous paragraph.

Protocol sampling will be initiated within 3 months after the regulators (Environmental Protection Agency/Department of Ecology) approve this plan.

F. PROTOCOL SAMPLE DESIGNATION

Protocol samples labels will be furnished by the sampling team from the Mobile Sampling Unit. The labels will be required to contain the following for each sample; a unique sample identification number, date and time of the sample collection, and the place of collection. The unique sample identification number shall be obtained by OSM from the Hanford Environmental Information System (HEIS). In addition, each sample bottle shall be identified with a bar code sticker attached by the bottle manufacturer. The bar code shall identify the lot number and the individual bottle during each sampling.

G. SAMPLING EQUIPMENT AND PROCEDURES

Protocol samples will be taken using grab samples. Grab samples will be taken in a manner similar to the ASTM E300-73, EPA-600/4-79-0929, Bottle On A String, an SW-846 approved procedure. Grab sampling of the combined BCE stream will use a Long Handled Dipstick for lowering the collecting device into the stream. This method of drawing the sample will be substituted for the Bottle On A String method and will be adapted to the sampling point. Since grab sampling is to be used for obtaining samples, no preventive maintenance will be required.

H. SAMPLE HANDLING AND ANALYSIS

Protocol samples will be analyzed for:

Ion Chromatography Anions
Inductive Coupled Plasma Metals
Graphite Furnace Atomic Absorption Metals
pH
Mercury
PCB
Volatile Organics
Semi-Volatile Organics
Total Organic Carbons
Gross Alpha and Beta
Gamma Energy Analysis
Strontium 90 and Cesium 137
Total Uranium
Total Dissolved Solids per EPA 160.1
Conductivity

B-PLANT CHEMICAL SEWER SAMPLING AND ANALYSIS PLAN

The above list was selected based on process knowledge from past sampling activities, especially sampling for the B-Plant Chemical Sewer Stream-Specific Report (WHC 1990). Conductivity, anions, total dissolved solids, and metals were selected since they give a good indication of overall water quality. Volatile organics, semi-volatile organics, and total organic carbons analyses were selected to confirm that these constituents used in process solutions are not present in the liquid effluent. Gross alpha/beta analysis will provide information on radionuclide content of the liquid effluent at the time sampling was performed. Total uranium plus the specific radionuclide analysis for Strontium 90 and Cesium 137 will provide information on the radionuclide content of the liquid effluent.

Protocol samples will be collected in commercially available, certified precleaned glass or plastic bottles. The sample volumes and number of containers are prescribed by the analytical laboratory and are subject to change. Sample volumes, container types, and preservatives are:

1. 125 ml polyethylene container with tetrafluoroethylene lined cap, no preservative for Ion Chromatograph anions and pH

2. 250 ml polyethylene container with tetrafluoroethylene lined cap, pH<2 by nitric acid preservative for Inductive Coupled Plasma Metals.

3. 500 ml polyethylene container with tetrafluoroethylene lined cap, pH<2 by nitric acid preservative for mercury.

4. 2 duplicate 40 ml amber glass containers with septum caps (tetrafluoroethylene lined), for Volatile Organics, filled without bubble formation and with no head space.

5. 1 liter amber glass container with tetrafluoroethylene lined cap for Semi-volatile organics, filled without bubble formation and with no head space.

6. 1000 ml polyethylene container with tetrafluoroethylene lined cap preserved with 2 ml nitric acid, for Strontium 90 and Cesium 137.

7. 250 ml polyethylene container with tetrafluoroethylene lined cap, no preservative for Total Dissolved Solids.

Preservatives required above will be supplied by WHC Sampling and Mobile Laboratory and will be added to the containers before going into the field. After sampling, the caps will be sealed to the containers with tamper proof tape. The containers will be labelled, then bagged and re-bagged. The outer bag will be taped with tamper-proof tape. After bagging, the samples will be refrigerated at 4 degrees Celsius until ready to ship when they will be placed and shipped in a cooler containing ice.

Field logs will be completed following the "Environmental Investigations and Site Characterization Manual", WHC-CM-7-7 and procedure EII 1.5 "Field Logbooks" at the time of sampling by the sampling team.

A chain-of-custody form will be filled out at the time the sample is placed in the cooler. Since a sample may consist of several containers, the chain-of-custody will account for each container. Once the sample has been drawn, it must be in the physical control or view of the custodian, locked in an area where it can not be tampered with, or prepared for shipping with tamper-proof tape applied. Physical control includes being in the sight of the custodian, being in a room which will signal an alarm when entered, or locked in a cabinet. When more than one person is involved in sampling, one person shall be designated the custodian and only the custodian signs as sampler. This person remains the custodian until the samples are transferred to another location or group when the custodian signs over to the designated receiver the released samples. The Liquid Effluent Sampling Quality Assurance Project Plan (WHC-SD-WM-QAPP-011) contains a copy of the chain-of-custody form to be used. A private carrier used to transport the samples and chain-of-custody documentation shall be bonded.

The protocol samples will be transported to an approved Westinghouse Hanford Company participant contractor or subcontractor laboratory for analysis consistent with SW-846 requirements.

The data from the analysis of the samples will be considered representative so long as at least 90 percent of the data points meet the established requirements in the laboratory contract for precision and accuracy. Data which does not meet this objective will be reviewed by the Office of Sample Management to determine whether the data can be used or whether corrective action should be taken. If necessary, corrective action in accordance with QI 16-2, WHC-CM-4-2 will be taken which could require repeating the sampling and analysis activity.

Field notes will be kept by sampling personnel which identifies date, time, weather conditions, plant operational status, and any other relevant information from each sampling event.

B-PLANT CHEMICAL SEWER SAMPLING AND ANALYSIS PLAN

I. REFERENCES

EPA, 1990, Test Methods For Evaluating Solid Waste, Physical/Chemical Methods, SW-846, 3rd Edition

WHC, 1990, B-Plant Chemical Sewer Stream Specific Report, WHC-EP-0342 Addendum 6

WHC, 1991a, Environmental Investigations and Site Characterization Manual, WHC-CM-7-7

WHC, 1991b, Liquid Effluent Sampling Quality Assurance Project Plan, WHC-SD-WM-QAPP-011, Rev 0

WHC, 1991c, Environmental Release Report For Calendar Year 1990, WHC-EP-0527

B-PLANT CHEMICAL SEWER SAMPLING AND ANALYSIS PLAN

APPENDIX

B-PLANT CHEMICAL SEWER SAMPLING AND ANALYSIS PLAN

A description of the contributing streams and the effluent flow path is presented.

A.1 CONTRIBUTING STREAMS

Table A-1 Contributing Streams to B-Plant Chemical Sewer

Building	System	Contributor	Flowrate(gal/d) Average Variation
211-B	Chemical Storage Tanks	Raw Water Steam Condensate Sanitary Water and Neutralized Spent Reagent (H_2SO_4, NaOH $NaPO_4$, $NaCO_3$)	0-100 20,000gal/multi-day
212-B	HVAC	Steam Condensate	0-50
217-B	Demineralizer	Sanitary Water	0-100
221-B	HVAC	Steam Condensate Sanitary Water	0-20
221-B	Instrument Air Compressor	Sanitary Water	<20,000
221-B	Pipe and Operating Gallery	Steam Condensate Cooling Water Raw and Sanitary	100
221-B	Scale Tanks	Overflow	Administrative Lock out
221-B	Electrical Gallery Sumps	Steam Condensate Leaks	Diverted to TK-10-1
222-B	HVAC	Steam Condensate Sanitary Water Dearborn 730	0-500
224-B	HVAC	Steam Condensate Sanitary Water Dearborn* 730	0-500
225-B	Yard Drains	Storm Water	0-100

* Dearborn Division of WR Grace & Co., Lake Zurich, IL

B-PLANT CHEMICAL SEWER SAMPLING AND ANALYSIS PLAN

TABLE A-1 CON'T

225-B	AMU Tanks Floor Drains	Steam Condensate Raw Water	0-500
225-B	HVAC	Sanitary Water Condensation	0-50
225-BC	Air Compressor	Raw Water	70,000
271-B	Basement Floor Drains	Steam Condensate Raw Water Janitor Supplies Maintenance Supplies	0-1000 total
	1st Level Floor Drains	Sanitary Water Janitor Supplies	
	2nd Level Floor Drains	Sanitary Water Janitor Supplies	
	3rd Level Floor Drains	Sanitary Water Steam Condensate	
271-B	HVAC	Steam Condensate Sanitary Water Dearborn 727 and 730	0-2000
271-B	Process Air Compressor	Raw Water, Condensate	70,000
276-B	Floor Drains	Steam Condensate	0-100
292-B	Floor Drains	Steam Condensate	0-50
2902-B	Sanitary Water Storage Tank	Sanitary Water	20,000
Manhole 5	Street Drain	Storm Water	0-50
		Total=	185,000

A.2 DESCRIPTION OF THE BCE FLOW PATH

The following is a description of individual contributors to the BCE in the sequence of the flow chart shown in Figure 1.

MANHOLE 1

Manhole 1 only receives liquid effluent from steam condensate from the 292-B Building. Routine effluent flow at Manhole 1 is estimated to average less than 20 gal/d.

292-B Building

This building is used for stack monitoring equipment. Only building heating steam condensate during the heating season is being released into the BCE effluent stream.

MANHOLE 2

Manhole 2 receives liquid effluent from Manhole 1 and from the 222-B Building. Routine effluent flow to Manhole 2 is estimated to average less than 50 gal/d.

222-B Building

Sanitary water and steam condensate from HVAC system are discharged into the BCE from 222-B Building. A Dearborn chemical Dearborn 730™ is used to treat the water in the HVAC.

MANHOLE 3

Manhole 3 receives liquid effluent from Manhole 2, 224-B Building and from two street drains. Routine effluent flow to Manhole 3 is estimated to average less than 100 gal/d.

224-B Building

Sanitary water and steam condensate from the ventilation system are discharged into the BCE from the 224-B Building. Dearborn 730 is used to treat the water in the HVAC. In addition, condensate from the water heater is discharged into the BCE.

Street Drains

Two street drains north of 224-B on 7th Street drain storm water into the BCE.

B-PLANT CHEMICAL SEWER SAMPLING AND ANALYSIS PLAN

MANHOLE 4

Manhole 4 receives liquid effluent from Manhole 3 and from 2902-B Emergency Sanitary Water. Routine effluent flow to Manhole 4 is estimated to average 20,000 gal/d.

2902-B Emergency Sanitary Water

Overflow from a 50,000 gallon tank of the emergency sanitary water supply is drained into the BCE. Overflow is required to maintain chlorine levels in the tank, to avoid freezing of the tank, and to maintain circulation within the tank. In addition, once a year, this 50,000 gallon tank is drained and flushed into the BCE over a twelve hour period.

MANHOLE 5

Manhole 5 receives liquid effluent from Manhole 4 and from a street drain. Routine effluent flow to Manhole 5 is estimated to average 20,000 gal/d.

Street Drain

Storm water runoff from a drain on 7th Street is drained into the BCE.

MANHOLE 6

Manhole 6 receives liquid effluent from Manhole 5 and from two yard drains south of 225-B Building. Routine effluent flow to Manhole 6 is estimated to average 20,000 gal/d.

225-B Yard Drains

Storm water runoff from two drains in the 225-B yard is drained into the BCE.

MANHOLE 7

Manhole 7 receives liquid effluent from Manhole 6 and from 225-BC Building. Routine effluent flow to Manhole 7 is estimated to average less than 90,000 gal/d.

225-BC Building

A liquid effluent stream is generated by the use of one of the two oil-less air compressors. The largest stream is raw water used to cool the air compressors while the second stream is liquids removed by the compressor from the air. Both streams are drained to the BCE.

MANHOLE 8

Manhole 8 receives liquid effluent from Manhole 7 and from HVAC from 225-B Building. Routine effluent flow to Manhole 8 is estimated to average 90,000 gal/d.

225-B Building

Condensate and chemicals used to treat the HVAC system is drained to the BCE.

CLEANOUT 9

Cleanout 9 receives liquid effluent from Manhole 8, 225-B Building, 221-B Building Pipe and Operating Gallery, and air compressors in the 271-B basement. Routine effluent flow to Cleanout 9 is estimated to average 185,000 gal/d.

225-B Building

Floor drains, overflow drains in the AMU, and safety shower drains contribute to the BCE. Administrative controls and/or tag and locks placed on the tanks in the AMU have been designed to eliminate the addition of chemicals to the BCE.

Possibly radiological contaminated effluent can enter the BCE from vent lines from drains leading to TK-100 and from the chill water in the Truck Port.

221-B Pipe and Operating Galleries

Two liquid streams from the Pipe and Operating galleries, condensate from steam heating and sanitary water from cooling the instrument air compressor, are drained into the BCE.

271-B Basement

A funnel drain collects effluent from two process air compressors which drains into the BCE.

MANHOLE 10

Manhole 10 receives liquid effluent from Cleanout 9. Routine effluent flow is estimated to average 185,000 gal/d.

MANHOLE 14

Manhole 14 receives liquid effluent from all sources in the BCE including 271-B basement sump and floor drains, Manhole 10, Manhole 13, and Cleanout 11. Since Manhole 14 receives all of the effluents from the BCE, the average flowrate is the same as for the BCE liquid effluent of 185,000 gal/d.

271-B Building Basement Sump and Floor Drains

A number of effluent streams drain into the BCE. Effluents from hot water tanks, heating-cooling coils in the AMU, the HVAC unit, water treatment chemicals for the HVAC, and common janitorial chemicals. In addition, steam condensate from the steam radiators is drained to the BCE.

CLEANOUT 12

Cleanout 12 receives liquid effluent from Stairwell 3. The average flowrate at the cleanout is estimated to average less than 50 gal/d

CLEANOUT 11

Cleanout 11 receives liquid effluent from Cleanout 12, 221-B 6" Stainless Steel Header, and 276-B. The average flowrate of the effluent is estimated to be less than 70 gal/d. (Note: 6" header flowrate is not included since it is presently under Administrative Control that has it's effluent diverted from the BCE to Tank TK-10-1.)

B-PLANT CHEMICAL SEWER SAMPLING AND ANALYSIS PLAN

221-B 6" Header

Presently the 6" header is locked out to divert all flow away from the BCE to TK 10-1 by Administrative Control. The header receives effluent from floor drains, scale tank overflow drains, funnel drains, and sumps which discharge into the 6" stainless steel header located in the Electric Gallery. In addition, the floor drains can collect chemical spills, water from safety showers, and common janitorial chemicals used for housekeeping operations. Further, AMU tanks and scale tanks in the operating gallery drain and can overflow into 3" drain pipes which drain to the 6" header. Vent headers for these tanks also drain through funnels into the 6" header. Administrative Controls have also locked out these AMU tanks and scale tanks to avoid the introduction of chemicals into the BCE.

In addition, 18 sumps in the electrical gallery collect liquids from spills, chemicals used for housekeeping operations, and condensate from steam heating. The sump pumps in these sumps will discharge the collected liquids into the 6" header. Since the sumps liquid level indicators are alarmed, an operator can manually divert the header effluent to TK-10-1. As noted above the header is presently locked out to divert the effluent to TK-10-1.

Floor drains from the 212-B Cask Handling Building are also discharged into the 6" header. However, no operations are presently taking place in the building and no discharge is presently occurring.

The 6" header is also monitored for radiological contamination. If the effluent is contaminated, a diverter valve will automatically route the effluent to TK-10-1.

276-B

Waste stream contributions from 276-B come from floor drains and inactive vessel overflow drains.

MANHOLE 13

Manhole 13 receives liquid effluent generated from the 217-B Building and the 211-B Tank Farm. The average flowrate at Manhole 13 is estimated to average less than 100 gal/d. However, during the periodic regeneration of the demineralizer approximately 13,000 gallons is released into the BCE over a period of 48 hours.

217-B Building

The 217-B demineralizer is regenerated two to three times a year. Both the anion and cation column are regenerated using sodium hydroxide and sulfuric acid respectively. Monosodium phosphate, and sodium carbonate are added to buffer the regeneration effluent. These solutions are transported by hose to tank SK-161. Some bleeding off of these buffered solutions is released to the 217-B floor drain.

211-B Tank Farm

The 20,000 gallons of regeneration solution buffered in tank SK-161 is released through a drain into the BCE over a multi-day period. This non-regulated buffered solution effluent has a pH ranging from 4 to 10 when released.

Condensate/cooling water from the heating/cooling coils of the vertical and horizontal chemical storage tanks is discharged to the BCE through two 4" steel headers.

151-BA SUMP

The 151-BA sump receives all of the BCE liquid effluent from Manhole 14. The sump has two pumps used to pump the BCE liquid effluent into 211-BA neutralization facility.

211-BA NEUTRALIZATION FACILITY

211-BA receives the liquid effluent from 151-BA sump. The neutralization facility is designed to neutralize the effluent by adding sodium hydroxide or sulfuric acid to the effluent to ensure that the effluent is between a pH of 4 and 9 before it is released into the 216-B-63 Ditch. This facility also houses pH and beta gamma monitors of the BCE stream.

216-B-63 DITCH

The 216-B-63 ditch receives the effluent from the BCE. At the head of the ditch is a routine flow proportional sampler and effluent flow totalizer. The totalizer uses a weir and a measured depth of the BCE flow to calculate the BCE flowrate.

INFORMATION

INFORMATION RELEASE REQUEST ORIGINAL

References: WHC-CM-3-4

COMPLETE FOR ALL TYPES OF RELEASE

Purpose		New ID Number
[] Speech or Presentation	[] Reference	
[] Full Paper (Check only one suffix)	[x] Technical Report	Existing ID Number (include revision, volume, etc.): WHC-SD-WM-PLN-029, Rev. 0
[] Summary	[] Thesis or Dissertation	
[] Abstract	[] Manual	If previously cleared, list ID number
[] Visual Aid	[] Brochure/Flier	
[] Speakers Bureau	[] Software/Database	
[] Poster Session	[] Controlled Database	Date Release Required: 12/19/91
[] Videotape	[] Other	

Title	Unclassified Category	Impact Level
B-Plant Chemical Sewer Sampling and Analysis Plan	UC-NA	3

COMPLETE FOR SPEECH OR PRESENTATION

Title of Journal	Group or Society Sponsoring
NA	NA

Date(s) of Conference or Meeting	City/State	Will proceedings be published? [] Yes [] No Will material be handed out? [] Yes [] No

Title of Conference or Meeting

CHECKLIST FOR SIGNATORIES

Review Required per WHC-CM-3-4	Yes	No	Reviewer Name (printed)	Signature	Date
Classification/Unclassified Controlled Nuclear Information	[]	[X]			
Patent - General Counsel	[X]	[]	S W BERGLIN	[signature]	12/12/91
Legal - General Counsel	[X]	[]	P.J. MACKEY	[signature]	12 Dec 91
Applied Technology/Export Controlled Information or International Program	[]	[X]			
WHC Program	[X]	[]	R. J. Murkowski	[signature]	12/10/91
Communications	[]	[X]			
DOE-RL Program	[X]	[]	T. H. Davies	[signature]	12/13/91
Publication Services	[X]	[]	D. M. NGUYEN	[signature]	1/10/92
Other Program	[X]	[X]	GL Crawford for J.D Hudspeth	[signature]	1-13-92
References Available to Intended Audience	[X]	[]			
Transmit to DOE-HQ/Office of Scientific and Technical Information	[]	[X]			

Information conforms to all applicable requirements. The above information is certified to be correct.

PART I

Author/Requestor (Printed/Signature) Date	INFORMATION RELEASE ADMINISTRATION APPROVAL STAMP
William E. Davis William E. Davis 12/10/91	Stamp is required before release. Release is contingent upon resolution of mandatory comments. APPROVED FOR RELEASE OFFICIAL DOCUMENT KMB Date 1/13/92
Responsible Manager (Printed/Signature) Date Marc W. Stevenson 12/10/91 Marc W. Stevenson	
Intended Audience [] Internal [] Sponsor [X] External	Date Received 1/13/92 KMB

BD-7600-062 (4/90) (EF) WEF074
Information Release Request

Part 2

DISTRIBUTION SHEET

To: Distribution | From: W. E. Davis | Date: Jan. 8, 1992

Project Title/Work Order:

EDT No.: 133505 | ECN No.:

Name	MSIN	With Attachment	EDT/ECN & Comment	EDT/ECN Only
D. M. Bogen	S6-65			
W. W. Bowen	S6-65	x		
W. E. Davis	S6-70	x		
D. C. Frick	S4-56			
J. L. Hyatt	R1-02	x		
D. E. Kelley	R1-48	x		
J. H. Kessner	T6-08	x		
R. J. Murkowski	S6-65	x		
D. M. Nguyen	R1-48			
K. A. Peterson	S6-70	x		
M. W. Stevenson	S6-70	x		
R. D. Weissenfels	S6-70	x		
Central Files	L8-04	x		
Document Clearance Administration	R1-08	x		
Unclassified Document Control	A4-65	x		
S. A. BRISBIN	H4-16	X		